



# ARL West

*A New Model for Department of Defense  
Science and Technology*

April 2016



## Vision

The Nation's Premier Laboratory for Land Forces.

## Mission

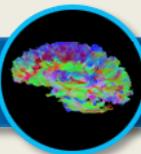
**DISCOVER, INNOVATE, & TRANSITION**

Science and Technology to ensure dominant strategic land power

*Making today's Army and the next Army obsolete*

## Extramural Basic Research

Steering and oversight of the systematic study to increase fundamental knowledge and understanding in physical, engineering, environmental, and life sciences related to long-term national security needs.



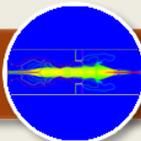
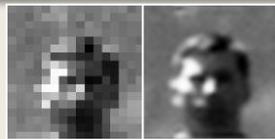
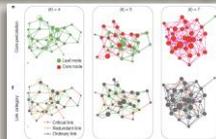
### Human Sciences

Fundamental understanding of Warfighter performance enhancement, training aids, and man-machine integration.



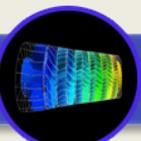
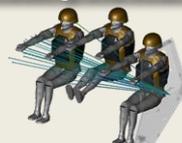
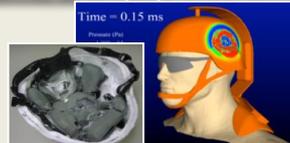
### Information Sciences

Fundamental understanding of information generation, collection, assurance, distribution, and exploitation.



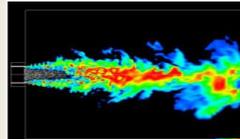
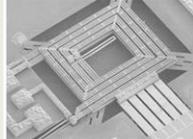
### Sciences for Lethality & Protection

Fundamental understanding of emerging technologies that support weapon systems, protection systems, and injury mechanisms affecting the Warfighter.



### Sciences for Maneuver

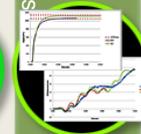
Fundamental understanding of the design, integration, control, and exploitation of highly adaptive platforms in complex environments.



**Computational Sciences**  
Fundamental understanding of computer hardware, high efficiency algorithms, and novel mathematical methods.



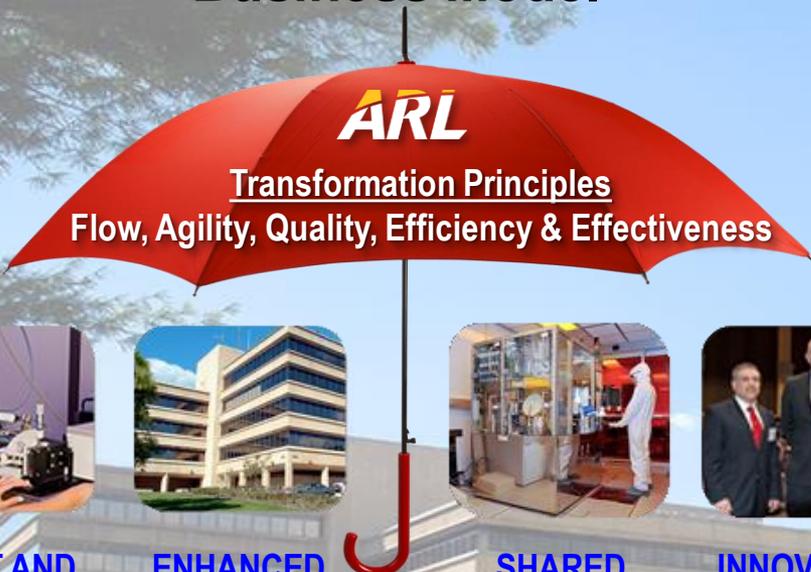
**Materials Research**  
Fundamental understanding of structural, electronic, photonic, and energy materials & devices.



**Assessment and Analysis**  
Quantitatively Assess the development and application of analytical tools and methodologies to quantitatively assess the military utility of Army, DoD, and foreign combat systems.

ARL Campaign Publications <http://www.arl.army.mil/publications>

## Piloting a New Laboratory Business Model



**ATTRACT AND  
RETAIN BEST &  
BRIGHTEST**



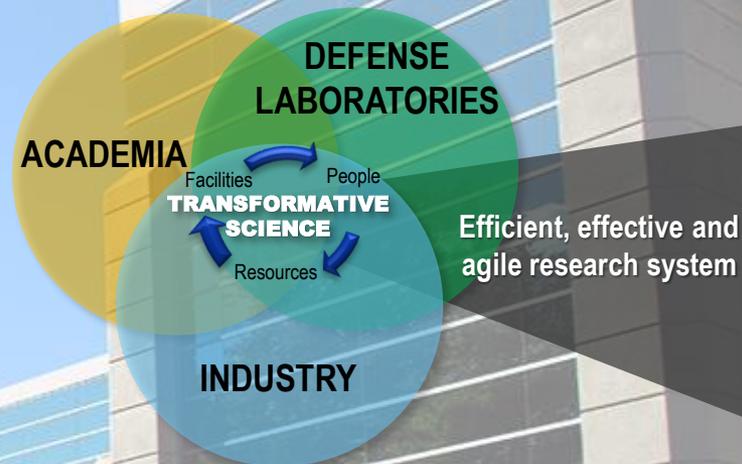
**ENHANCED  
USE LEASE**



**SHARED  
MODERN  
FACILITIES**



**INNOVATION  
PRACTICES**



*"We will need new technology over the next 10 years to make a leaner and more capable Army."*

**GEN Raymond T. Odierno**  
38th Chief of Staff, Army

**Responding to the National Security Challenges of the 21st Century**

Open Campus Website: <http://www.arl.army.mil/opencampus/>

**An Other Transaction is an agreement that ARL can use to partner with non-traditional Defense suppliers and innovative small businesses**

*Promotes technical innovation*

*Offers great flexibility*

*Promotes cooperative relationships*

*Nimble where traditional government contracts are not*

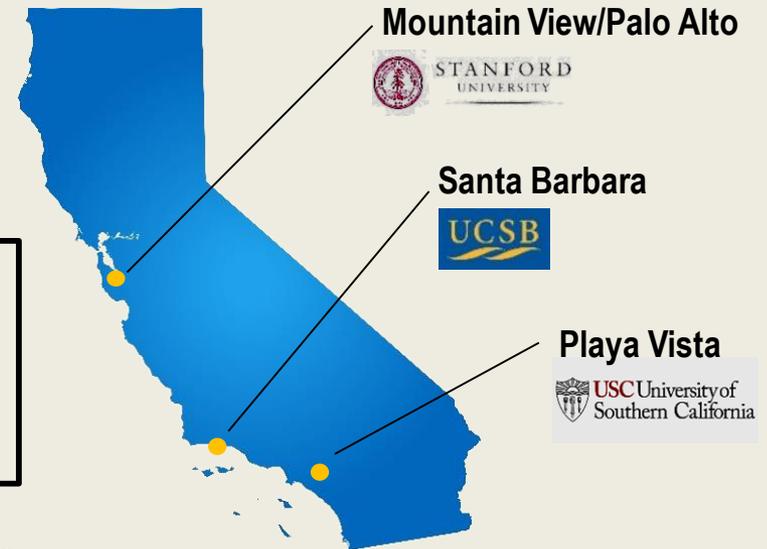
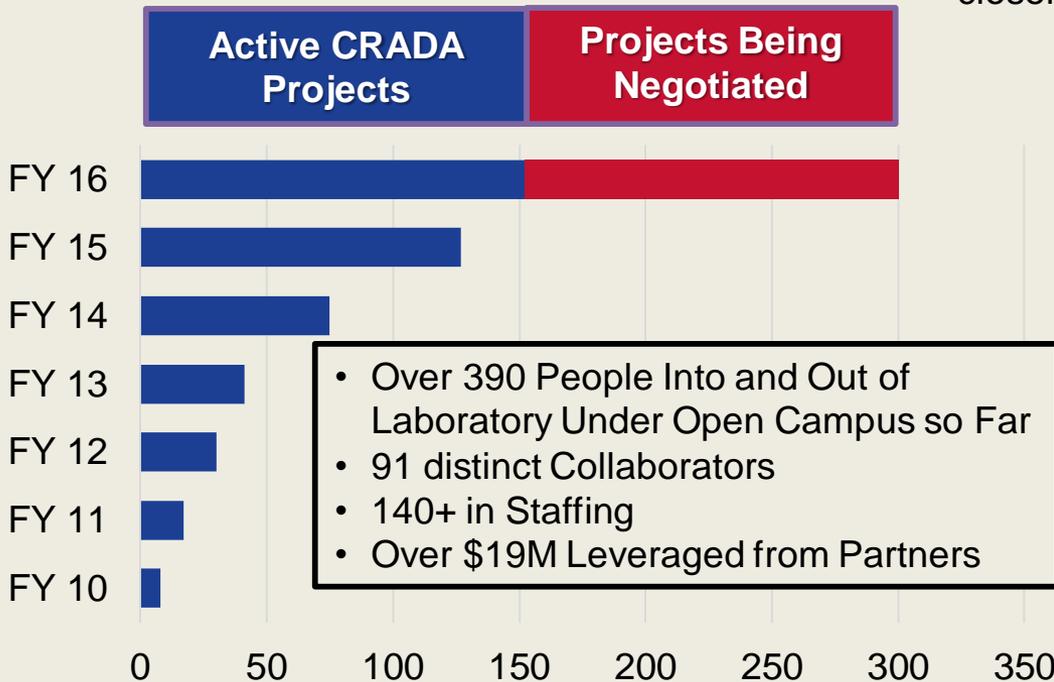


## Collaborative Mechanisms

- Cooperative Research and Development Agreements (CRADAs)
- Patent License Agreements
- Educational Partnerships
- Partnership Intermediary Agreements

## ARL West

- Local Army Laboratory for west coast university interactions & recruitment
- Leverage ongoing research at California Universities and regional start up companies
- ARL-distinct facilities made available in the Playa Vista areas
- Excellent potential for increased innovation through closer collaboration





## *Facilitate generation, identification & harvesting of technology opportunities*

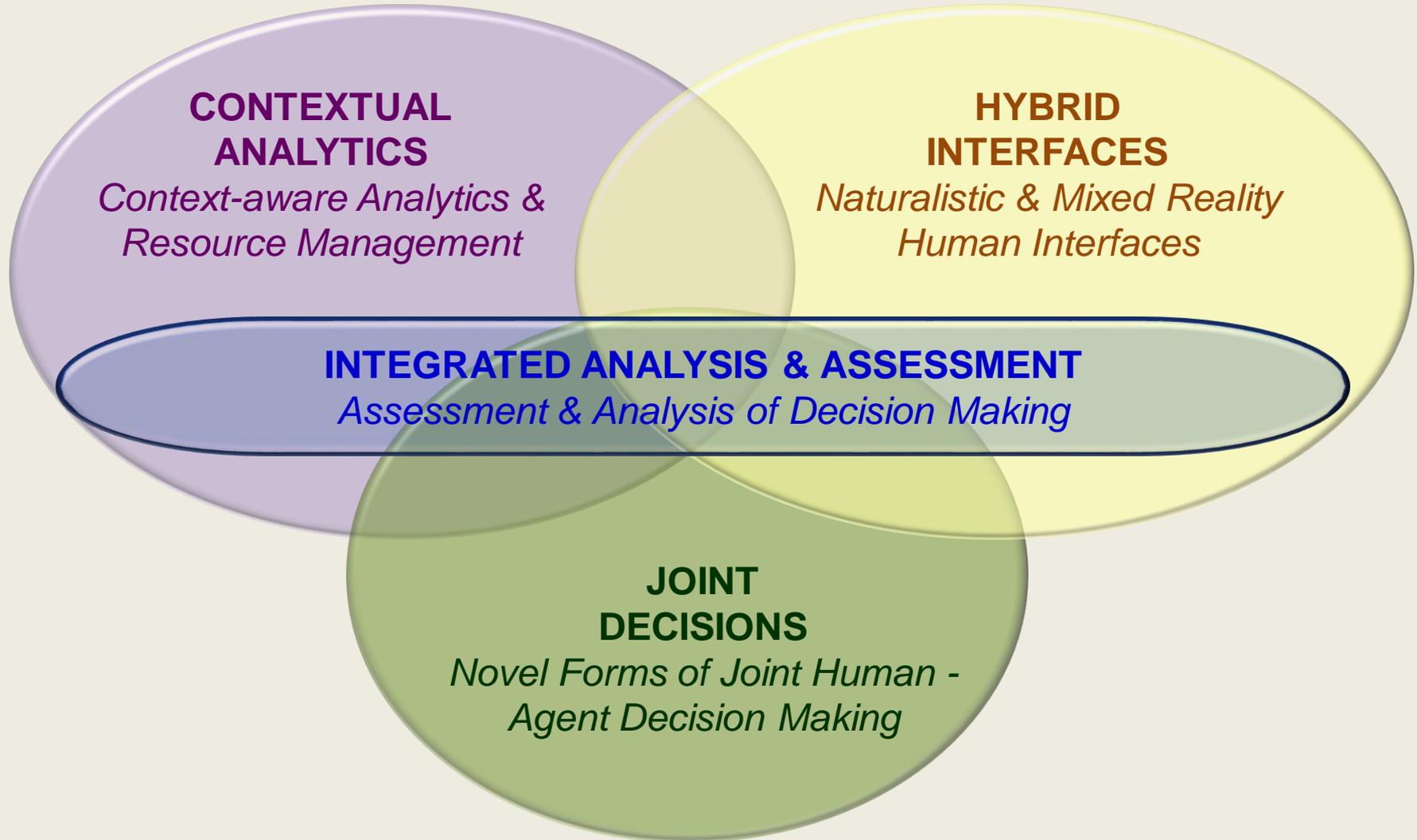
- **Create a west coast collaborative innovation hub to solve Army problems**
  - **Establish close ties with academia, start-ups & established companies**
  - **Establish west coast laboratory to jointly solve Army technology needs**
  - **Transition new non-DoD specific technologies into the Army**
  
- **Access to large pool of subject matter experts**
  - **Capitalize on strong west coast academic institutions & graduates with regional preference**
  - **Draw from existing large regional talent pool**
  - **Expand expert networks into industry and with international partners**



- **Focus:** Human Information Interaction - the interaction of humans and information for decision making
- **Motivation:** humans increasingly need to interact with huge amounts of information and less with the computing devices that define them
- **Research aims:** discover, understand, exploit, and apply fundamental principles of human-information interaction across domains, including complex information systems, human-agent teams, cybersecurity, communication, and organizational and social networks
- **Approach:** pursue technologies to provide situational understanding & relevant actionable information to users at the point of need by engaging multidisciplinary, multi-organizational teams based at ARL-West facility



# Four Major Research Thrusts





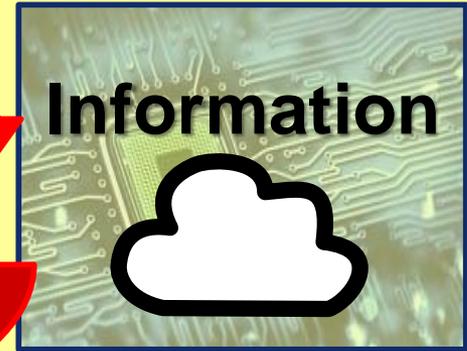
## ***Naturalistic & Mixed Reality Human Interfaces***

***Balanced bi-directional interfaces for effective, robust human-human and human-agent communications and decision making***

***How can interfaces develop and leverage deep insights into human states and intentions?***



**Improve  
Communication &  
Decision Making**

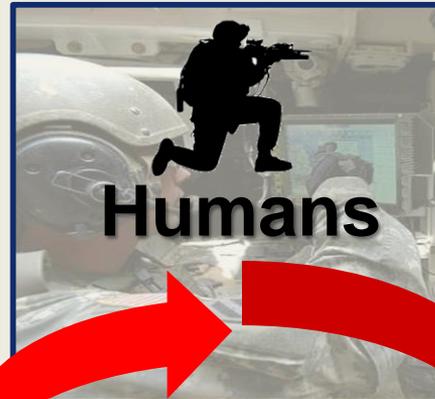


***How can hybrid interface concepts join the strengths of naturalistic and mixed reality interface concepts?***

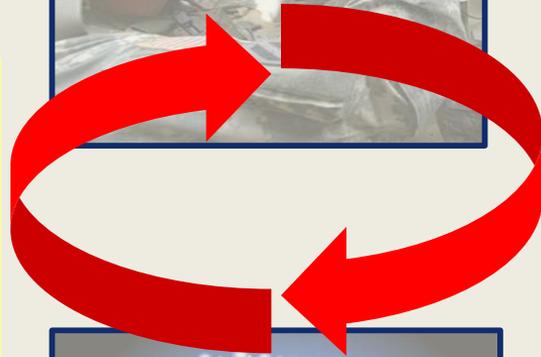


## ***Novel Forms of Joint Human - Agent Decision Making***

***Effective teaming of human & autonomous, intelligent agents***



***How to accentuate strengths & mitigate weaknesses of human & autonomous agents?***



***How to enable heterogeneous teams to make decisions faster & more effectively than homogeneous teams?***

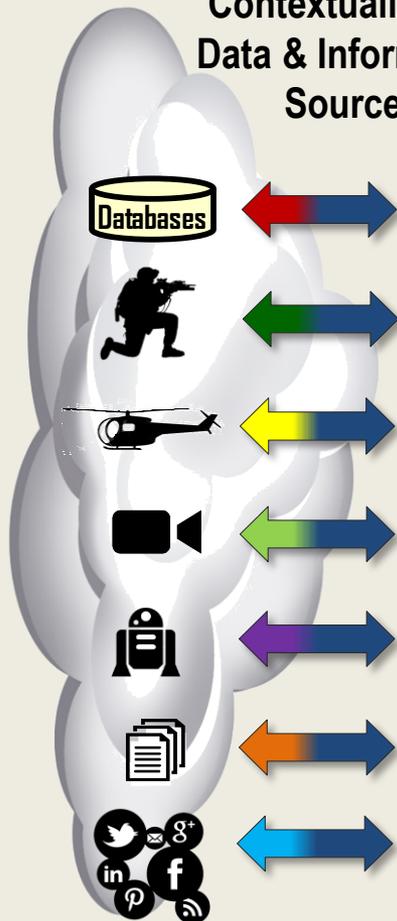




## Context Aware Analytics & Resource Management

*Enable effective information gathering to enhance decision-making*

Contextualization  
Data & Information  
Sources

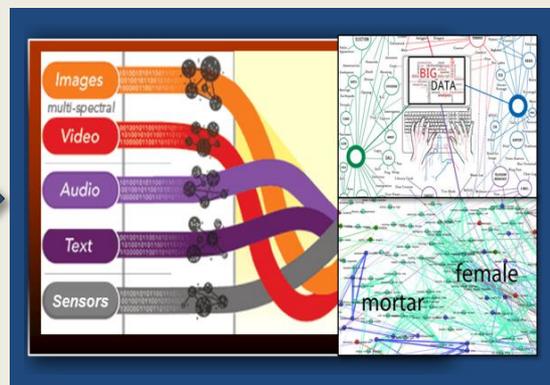


Mission-relevant  
Information  
Sources



*How to efficiently match relevant information products to mission needs to deliver focused, actionable information to the point of need?*

Multi-modal Processing  
& Analytics



Actionable  
Information



*How to enable effective information gathering & processing to enhance decision-making?*



- **ARL West is a key part of ARL's efforts to significantly expand its outreach to the full range of technology inventors & innovators**
- **ARL brings:**
  - **Access to Army needs and requirements**
  - **Specialized facilities & data sets related to Army needs**
  - **Highly skilled technological workforce focused on Soldier needs**
- **Our Partners bring:**
  - **Access to commercial technology directions & best practices**
  - **Specialized facilities & data sets**
  - **Highly skilled technological workforce focused on commercial needs**

***ARL West is at the vanguard of the DoD's efforts to rapidly bring the best technologies to our Warfighters***